

Marine Mammals of the Atlantic Region including the Gulf of Mexico

INTRODUCTION

The Atlantic region has 62 stocks of at least 39 species of marine mammals. The U.S. Fish and Wildlife Service has management authority for two stocks of West Indian manatee (Florida and Antillean), and NOAA Fisheries has responsibility for management of the remaining cetacean and pinniped stocks.

According to criteria provided by the 1994 Amendments to the MMPA, there are 26 strategic stocks (Table 24-1). In the western North Atlantic, the strategic stocks include 6 stocks of endangered whales (right, humpback, fin, sei, blue, and sperm whales); the mid-Atlantic coastal bottlenose dolphin which is depleted under the MMPA; and 13 stocks where estimated mortality exceeds their PBRs (Cuvier's beaked whale, True's beaked whale, Gervais' beaked whale, Blainville's beaked whale, Sowerby's beaked whale, long-finned pilot whale, short-finned pilot whale, Atlantic white-sided dolphin, common dolphin, Atlantic spotted dolphin, pantropical spotted dolphin, mid-Atlantic offshore ottenose dolphin, and the Gulf of Maine/Bay of Fundy harbor porpoise).

In the northern Gulf of Mexico, the strategic stocks include the endangered sperm whale, stocks of northern bottlenose dolphin in coastal bays and sounds, dwarf and pygmy sperm whales, and the Florida and Antillean stocks of endangered West Indian manatees. Of these stocks, North Atlantic right whales are believed to be increasing, mid-Atlantic coastal bottlenose dolphins are believed to be stable, West Indian manatees are believed to be declining, and the trends for the remaining 54 stocks are unknown.

BOTTLENOSE DOLPHIN: GULF OF MEXICO, BAY, SOUND AND ESTUARINE STOCKS

Stock Definition and Geographic Range

Studies relying on identification of individual dolphins suggest that bottlenose dolphins inhabiting many of the bays, sounds, and other estuaries adjacent to the Gulf of Mexico form discrete communities. Although breeding may

occur between adjacent communities, the geographic nature of these areas suggests that each community exists as a functioning unit of its ecosystem and, under the MMPA, must be maintained as such. Therefore, each of the areas forming a contiguous, enclosed or semi-enclosed body of water is considered to contain a distinct bottlenose dolphin stock.

Mark-recapture studies using photo-identification of individual dolphins in the vicinity of Sarasota and Tampa Bays in Florida showed that individual dolphins remain in a given area year around. Three distinct dolphin "communities" have been described in the area in and around Sarasota Bay. One community was formed by dolphins residing in the Gulf of Mexico coastal waters, another consisted of the dolphins in the deep water areas of Passage Key Inlet and Tampa Bay (adjacent to Sarasota Bay), and a third community resided in the shallow waters of Sarasota Bay.

Electrophoretic isozyme analysis showed significant differences between dolphins of the shallow-water Sarasota community and the Tampa Bay community, and from dolphins from Charlotte Harbor, to the south; however, there was a high degree of genetic heterozygosity indicating that the Sarasota community was not genetically isolated. It has been suggested that the Sarasota community is likely one of a number of communities which comprise an extended population, the limits of which are unknown. The continuous distribution of bottlenose dolphins around the Gulf of Mexico coast theoretically allows genetic exchange between adjacent communities; however, the females of the highly-structured Sarasota community form a stable, discrete, long-term breeding unit with strong geographical fidelity.

Recent photo-identification and radio-tracking studies confirmed that some individual dolphins remain in the same general areas within Matagorda Bay, Texas, throughout the year; thus, the situation there may be similar to that of the Florida west coast. Movement of resident bottlenose dolphins in Texas through passes linking bays with the Gulf of Mexico appears to be relatively limited, but does occur and suggests that these stocks may not be

Table 24-1.**Status of Marine Mammal Stocks
in the Atlantic Region, including the Gulf of Mexico**

Species	Stock Area	N _{MIN} ¹	PBR ²	Total Annual Mortality	Strategic Status ³	MMPA/ESA Status ⁴	Trend ⁵
North Atlantic right whale	W. North Atlantic	295	0.4	2.5	Y	E	I
Humpback whale	W. North Atlantic	4,848	9.7	1	Y	E	U
Fin whale	W. North Atlantic	1,704	3.4	N/A	Y	E	U
Sei whale	W. North Atlantic	155	0.3	0.3	Y	E	U
Minke whale	E. Coast Canada	2,053	21.0	2.5			U
Blue whale	W. North Atlantic	N/A	N/A	0	Y	E	U
Sperm whale	W. North Atlantic	226	0.5	1.6	Y	E	U
Dwarf sperm whale	W. North Atlantic	N/A	N/A	N/A		?	U
Pygmy sperm whale	W. North Atlantic	N/A	N/A	N/A		?	U
Killer whale	W. North Atlantic	N/A	N/A	0			U
Pygmy killer whale	W. North Atlantic	6	0.1	0			U
Northern bottlenose whale	W. North Atlantic	N/A	N/A	0			U
Cuvier's beaked whale	W. North Atlantic	N/A	N/A	34	Y	M>PBR	U
True's beaked whale	W. North Atlantic	N/A	N/A	34	Y	M>PBR	U
Gervais' beaked whale	W. North Atlantic	N/A	N/A	34	Y	M>PBR	U
Blainville's beaked whale	W. North Atlantic	N/A	N/A	34	Y	M>PBR	U
Sowerby's beaked whale	W. North Atlantic	N/A	N/A	34	Y	M>PBR	U
Risso's dolphin	W. North Atlantic	11,140	111	68			U
Pilot whale (long-finned)	W. North Atlantic	3,537	28	109	Y	M>PBR	U
Pilot whale (short-finned)	W. North Atlantic	457	3.7	109	Y	M>PBR	U
Atlantic white-sided dolphin	W. North Atlantic	12,538	125	127	Y	M>PBR	U
White-beaked dolphin	W. North Atlantic	N/A	N/A	0.0			U
Common dolphin	W. North Atlantic	3,233	32	449	Y	M>PBR	U
Atlantic spotted dolphin	W. North Atlantic	4,885	9.8	31	Y	M>PBR	U
Pantropical spotted dolphin	W. North Atlantic	N/A	N/A	31	Y	M>PBR	U
Striped dolphin	W. North Atlantic	9,165	73	63			U
Spinner dolphin	W. North Atlantic	N/A	N/A	1.0			U
Bottlenose dolphin	Mid-Atlantic offshore	9,195	92	128	Y	M>PBR	U
Bottlenose dolphin	Mid-Atlantic coastal	2,482	25	29	Y	D	S

*...to be continued in next table...*¹ N_{MIN} = Minimum population is estimated as the lower 20th percentile of the log-normal distribution of the population estimate, which is equivalent to the lower limit of a 60% two-tailed confidence interval.² PBR = Potential biological removal.³ Strategic status: Y = yes, N/A = information is not available and N/D = estimated value has not been determined at this time.⁴ MMPA/ESA status: E = listed as endangered and T = listed as threatened under the Endangered Species Act.

D = listed as depleted under the Marine Mammal Protection Act.

⁵ Trend is increasing (I), stable (S), decreasing (D), and unknown (U).

reproductively isolated from the coastal stocks. For example, two bottlenose dolphins previously seen in the South Padre Island, Texas, coastal area were seen in Matagorda Bay, 285 km north, in May 1992 and May 1993. Preliminary analyses of MtDNA using polymerase chain reaction procedures suggested that Matagorda Bay dolphins appear to be a localized population. Over 1,000 individual bottlenose dolphins have been identified in bay and coastal waters near the northeast end of Galveston Island, Texas, but most of these were sighted only once with only 200 individuals reported to use the area over the long term.

Much less is known about the movements of resident bottlenose dolphins in estuaries of the northern Gulf of Mexico. Seasonal differences in bottlenose dolphin abundance in Mississippi Sound suggest seasonal migration; however, the spatial migration patterns are not currently known. It appears probable that some exchange occurs between the Mississippi Sound stock and the coastal stock in this area. Additional information may result in the future combining of these stocks in this area.

Population Size

Population size for all of the stocks except Sarasota Bay, Florida, was estimated from preliminary analyses of line-transect data collected during aerial surveys conducted in September-October 1992 in Texas and Louisiana, in September-October 1993 in Louisiana, Mississippi, Alabama, and the Florida panhandle, and aerial surveys of the west coast of Florida in September-November. Stock size in Sarasota Bay, Florida, was obtained through direct count of known individuals.

Minimum Population Estimate

Minimum population estimates were calculated from the estimates of population size and their associated coefficients of variation (Table 24-1). Where the population size resulted from a direct count of known individuals, the minimum population size was identical to the estimated population size.

Current Population Trend

Population data are insufficient to determine trends for the stocks of bottlenose dolphin. However, three anomalous mortality events

occurred among portions of the stocks between 1990 and 1994, and while these events may have resulted in declines in some populations, it is not possible to accurately partition the mortalities between the bay and coastal stocks. Thus the impact of these mortality events on the stocks is not known.

Status of Stock

Bottlenose dolphin PBRs are calculated using a recovery factor of 0.50 because of their unknown status relative to OSP. Estimates of PBR for each stock are given in Table 24-1.

Even though stocks are not listed as threatened or endangered, the occurrence of the three anomalous mortality events is cause for concern. While the effects of the mortality events on stock abundance has not yet been determined, the evidence suggests that bottlenose dolphin stocks in the northern and western coastal portion of the U.S. Gulf of Mexico may have experienced a morbillivirus epidemic in 1993. Seven of 35 live-captured bottlenose dolphins (20%) from Matagorda Bay, Texas, in 1992, tested positive for previous exposure and it is possible that other estuarine resident stocks have been exposed as well.

Limited population monitoring surveys in Mississippi Sound indicated a significantly lower average summer bottlenose dolphin abundance between 1985 and 1993. The apparent decline in summer abundance of bottlenose dolphins in Mississippi Sound is evidence of a possible downward trend in abundance; however, there are insufficient data available with which to conduct a meaningful trend analysis. The relatively high number of bottlenose dolphin deaths which occurred during the recent mortality events suggests that some of these stocks may be physiologically stressed, possibly from nearshore pollution and chemical contamination or other causes. For these reasons, and because the PBR for most of these relatively small stocks would be exceeded with the incidental capture of a single dolphin, each of these stocks is recognized as a strategic stock.

HARBOR PORPOISE: GULF OF MAINE/BAY OF FUNDY STOCK

Stock Definition and Geographic Range

This harbor porpoise stock is found in U.S. and Canadian waters. During the summer (July

to September), harbor porpoise are concentrated in the northern Gulf of Maine-southern Bay of Fundy region, generally in waters less than 150 meters deep. During fall (October to December) and spring (April to June), harbor porpoise are widely dispersed from North Carolina to Maine, though in much lower densities than that seen during the summer. No specific migratory routes to the northern Gulf of Maine/lower Bay of Fundy region have been documented. Animals are seen from the coastline to the middle of the Gulf of Maine (>200 meters deep) in both spring and fall. There is little information about the distribution of harbor porpoise during winter (December to March), although numerous strandings have occurred on beaches from North Carolina to New York. There are two stranding records from Florida.

Four separate populations have been proposed in the western North Atlantic; these being the Gulf of Maine/Bay of Fundy, Gulf of St. Lawrence, Newfoundland and Greenland populations. Presently there is insufficient evidence to accept or reject this hypothesis for the population structure. Results of a workshop held in February 1994 were inconclusive with respect to population structure of harbor porpoise in the western North Atlantic, although it was agreed that animals found in the Gulf of Maine and Bay of Fundy are from the same stock. To resolve the larger scale stock structure question, research is currently being conducted to reanalyze existing genetic data and analyze new samples.

Population Size

To estimate the absolute population size of the harbor porpoises aggregated in the Gulf of Maine/Bay of Fundy region during the summer, two line-transect sighting surveys were conducted, one in 1991, the other in 1992. The abundance estimates were 37,500 (CV = 0.29, 95% CI = 26,700-86,400) and 67,500 (CV = 0.23, 95% CI = 32,900-104,600), respectively. A weighted-average estimate of harbor porpoise abundance was 47,200 (CV = 0.19, 95% CI = 39,500-70,600), where each estimate was weighted by the inverse of its variance. Possible reasons for the inter-annual abundance and distribution differences include inter-annual changes in water temperature and availability of primary prey species which could have affected the distribution of porpoise in the area surveyed.

Minimum Population Estimate

The minimum population estimate calculated for this population is 40,297 porpoises (Table 24-1).

Current Population Trend

Data are insufficient to determine the population trends for this species. Although previous abundance estimates for harbor porpoises in the Gulf of Maine/Bay of Fundy are available from earlier studies, these cannot be used in a trends analysis because they were for selected small regions within the entire known summer range and, in some cases, did not incorporate any estimate of the probability that an animal on the transect track line will be missed.

Status of the Stock

Although there are insufficient data to determine the population trends for this stock, it is classified as strategic because total annual fishery-related mortality and serious injury exceeds an estimated PBR of 403 animals. As a result, NOAA Fisheries has proposed listing the Gulf of Maine harbor porpoise as threatened under the ESA. In Canada, the Cetacean Protection Regulations of 1982, promulgated under the standing Fisheries Act, prohibit the catching or harassment of all species of cetaceans, including the harbor porpoise, although incidental takes of harbor porpoise in gillnets continue to occur in U.S. and Canadian waters.

GRAY SEAL: WESTERN NORTH ATLANTIC STOCK

Stock Definition and Geographic Range

In the western North Atlantic, there is one stock of gray seals that ranges from New England to Labrador and that is centered in the Gulf of St. Lawrence. This stock is separated by both geography and differences in the breeding season from the eastern Atlantic stock. The western Atlantic stock is distributed and breeds principally in eastern Canadian waters. However, small numbers of animals and pupping females have been observed on several isolated islands along the Maine coast and in Nantucket-Vineyard Sound, Massachusetts.

Table 24-1.
(Contd.)**Status of Marine Mammal Stocks
in the Atlantic Region, including the Gulf of Mexico**

Species	Stock Area	N _{MIN} ¹	PBR ²	Total Annual Mortality	Strategic Status ³	MMPA/ESA Status ⁴	Trend ⁵
<i>...continued from previous table...</i>							
Harbor porpoise	Gulf of Maine / Bay of Fundy	40,279	403	1,876	Y	M>PBR	U
Harbor seal	W. North Atlantic	28,810	1729	476			I
Gray seal	N.W. North Atlantic	2,035	122	4.5			I
Harp seal	N.W. North Atlantic	N/A	N/A	0			I
Hooded seal	N.W. North Atlantic	N/A	N/A	0			I
Sperm whale	N. Gulf of Mexico	411	0.8	0	Y	E	U
Bryde's whale	N. Gulf of Mexico	17	0.2	0			U
Cuvier's beaked whale	N. Gulf of Mexico	20	0.2	0			U
Blainsville's beaked whale	N. Gulf of Mexico	N/A	N/A	0			U
Gervais' beaked whale	N. Gulf of Mexico	N/A	N/A	0			U
Bottlenose dolphin	Gulf of Mexico outer continental shelf	43,233	432	5			U
Bottlenose dolphin	Gulf of Mexico shelf & slope	4,530	45	5			U
Bottlenose dolphin	W. Gulf of Mexico coastal	2,938	29	13			U
Bottlenose dolphin	N. Gulf of Mexico coastal	3,518	35	10			U
Bottlenose dolphin	E. Gulf of Mexico coastal	8,963	90	8			U
Bottlenose dolphin	Gulf of Mexico inland waters ⁶	N/A	39.7	30	Y	?	U
Atlantic spotted dolphin	N. Gulf of Mexico	2,555	23	1.5			U
Pantropical spotted dolphin	N. Gulf of Mexico	26,510	265	1.5			U
Striped dolphin	N. Gulf of Mexico	3,409	34	0			U
Spinner dolphin	N. Gulf of Mexico	4,465	45	0			U
Rough-toothed dolphin	N. Gulf of Mexico	660	6.6	0			U
Clymene dolphin	N. Gulf of Mexico	4,120	41	0			U
Fraser's dolphin	N. Gulf of Mexico	66	0.7	0			U
<i>...to be continued in next table...</i>							

¹ N_{MIN} = Minimum population is estimated as the lower 20th percentile of the log-normal distribution of the population estimate, which is equivalent to the lower limit of a 60% two-tailed confidence interval.

² PBR = Potential biological removal.

³ Strategic status: Y = yes, N/A = information is not available and N/D = estimated value has not been determined at this time.

⁴ MMPA/ESA status: E = listed as endangered and T = listed as threatened under the Endangered Species Act.

D = listed as depleted under the Marine Mammal Protection Act.

⁵ Trend is increasing (I), stable (S), decreasing (D), and unknown (U).

⁶ Represents at least 33 individually recognized stocks of bottlenose dolphin in U.S. Gulf of Mexico bays, sounds, and other estuaries.

Population Size

A winter breeding colony on Muskeget Island, west of Nantucket Island, may provide some measure of gray seal population trends and the rate of expansion of their distribution. During the 1980s, as the gray seal population and range expanded in eastern Canada, sightings in New England increased. In 1988, 5 pups were born at Muskeget. The number of pups increased to 12 in 1992, 30 in 1993, and 59 in 1994. Maximum counts obtained during the spring molt did not exceed 13 in any year during the 1970s, but rose to 61 in 1984, 192 in 1988, 503 in 1992, and 1,549 in 1993. Aerial surveys in April and May of 1994 recorded a peak count of 2,035 gray seals for Muskeget Island (Nantucket) and Monomoy (Cape Cod) combined.

While estimates of the total western Atlantic population are not available, pup production on Sable Island, Nova Scotia, has been about 13% per year since 1962. The 1986 population estimate for individuals that are one year old and older was between 100,000 and 130,000 animals. The 1993 estimate (Sable Island and Gulf of St. Lawrence stocks) is 143,000 animals. The population in waters off Maine has increased from about 30 in the early-1980s to 500 to 1,000 animals in 1993.

Gray seals, like harbor seals, were hunted for bounty in New England waters until the late-1960s. Researchers and fishery observers have documented incidental mortality in several fisheries in recent years, particularly within the Gulf of Maine. An unknown level of mortality also occurs in the mariculture industry (i.e., salmon farming), and from deliberate shooting. An unknown number of gray seals have been taken in Newfoundland and Labrador, Gulf of St. Lawrence, and Bay of Fundy groundfish gillnets, Atlantic Canada and Greenland salmon gillnets, Atlantic Canada cod traps, and in Bay of Fundy herring weirs. In addition to incidental catches, some mortalities (e.g., seals trapped in herring weirs) were the result of direct shooting, and there were culls during the 1970s and early-1980s on Sable Island of about 1,700 animals annually. Estimated average annual fishery-related mortality and serious injury to this stock during 1990-93 attributable to U.S. fisheries was 4.5 gray seals ($CV = 2.00$).

Minimum Population Size

The minimum population estimate based

on uncorrected total counts is 2,035 gray seals.

Current Population Size

Gray seal abundance is likely increasing for waters of the eastern U.S. EEZ, but the actual trend is unknown. In Canadian waters, the population has been increasing for several decades. Approximately 57% of the northwest Atlantic population is from the Sable Island stock.

Status of Stock

Potential biological removal (PBR) was specified as the product of minimum population size (2,035), one-half the maximum productivity rate (0.06), and a recovery factor of 1.0, to give a PBR for this stock of 122 gray seals.

The status of the gray seal population, relative to OSP, in U.S. and Canadian Atlantic coast waters is unknown. The species is not listed as threatened nor endangered under the ESA. Recent information indicate that this population is increasing. In New England waters, both the number of pupping sites and pup production is increasing. In Canada they are protected from harassment and intentional killing under the Marine Mammal Regulations, although some aquaculture operators have been authorized to shoot nuisance animals to protect their facilities. The estimated annual level of human-caused mortality and serious injury in the U.S. Atlantic EEZ does not exceed PBR; therefore, this stock is not a strategic stock.

NORTH ATLANTIC RIGHT WHALE: WESTERN NORTH ATLANTIC STOCK

Stock Definition and Geographic Range

Individual right whales in this population range from wintering and calving grounds in coastal waters of the southeastern United States to summer feeding, nursery, and mating grounds in New England waters and northward to the Bay of Fundy and the Scotian Shelf. Long-distance movements as far north as Newfoundland, the Labrador Basin, and southeast of Greenland, have been reported and suggest an extended range for at least some individuals and perhaps habitat areas not presently well described. Likewise, while a calving and wintering ground is described for coastal waters of the southeastern U.S., 85% of the population is

unaccounted for during the winter season, and sightings from the Gulf of Mexico suggest that the range of this species may be more extensive than previously believed.

Research to date suggests five major habitats or congregation areas for western North Atlantic right whales: southeastern United States coastal waters, Great South Channel, Cape Cod Bay, Bay of Fundy, and Scotian Shelf. However, the results from satellite tagging studies suggest that movements within and between habitats and within regions may be more extensive than previously thought. When compared to the results of satellite tagged animals, sightings of individuals separated by perhaps two weeks cannot be assumed to indicate a stationary or resident animal. Rather, movement data have shown rather lengthy and somewhat distant excursions within a few weeks time within a season. These findings cast new light on the extent of movements and habitat use by right whales, and raise new questions about the purpose or strategies for such excursions.

New England waters are a primary feeding habitat for the right whale, which appears to feed primarily on calanoid copepods in this area. These dense zooplankton patches are likely a primary characteristic of the spring, summer, and fall right whale habitat. During the peak feeding season in Cape Cod and Massachusetts Bays, the acceptable surface copepod resource is limited to perhaps 3% of the region. While feeding in the coastal waters off Massachusetts has been better studied, feeding by right whales have been observed elsewhere over Georges Bank, in the Gulf of Maine, in the Bay of Fundy, and over the Scotian Shelf. The characteristics of acceptable prey distribution in these areas is not as well known as off Massachusetts. New England waters also serve as a nursery for calves and, in some cases, for mating.

Genetic analyses of tissue samples is providing insights to stock definition. It has been suggested that western North Atlantic right whales probably represent a single breeding population that may be based on three matriline. Genetics also suggests that, in addition to the Bay of Fundy, there exists an additional and undescribed summer nursery area utilized by approximately one-third of the population. As described above, a related question is where individuals other than calving females and a few juveniles overwinter. One or more major wintering and summering grounds have yet to be described for this population.

Population Size

Based on a census of individual whales identified using photo-identification techniques, the western North Atlantic population size was estimated to be 295 individuals in 1992.

Minimum Population Size

It is assumed that the census of identified whales in 1992 represents a minimum population size estimate (295 individuals).

Current Population Size

The size of this population may have been as low as 50 or fewer animals at the turn of the century compared to an estimated 295 presently, suggesting that the stock is showing signs of slow recovery.

Status of Stock

Potential biological removal was specified as the product of minimum population size (295), one-half the maximum productivity rate (0.02), and a "recovery" factor of 0.1 because this species is listed as endangered under the ESA. Potential biological removals for the northern right whale is 0.4 whales.

Table 24-1.
(Contd.)

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Species	Stock Area	N _{MIN} ¹	PBR ²	Total Annual Mortality	Strategic Status ³	MMPA/ESA Status ⁴	Trend ⁵
...continued from previous table...							
Killer whale	N. Gulf of Mexico	197	2	0			U
False killer whale	N. Gulf of Mexico	236	2.4	0			U
Pygmy killer whale	N. Gulf of Mexico	285	2.8	0			U
Dwarf sperm whale	N. Gulf of Mexico	N/A	N/A	0	Y	?	U
Pygmy sperm whale	N. Gulf of Mexico	N/A	N/A	0	Y	?	U
Melon-headed whale	N. Gulf of Mexico	2,888	29	0			U
Risso's dolphin	N. Gulf of Mexico	2,199	22	19			U
Pilot whale (short-finned)	N. Gulf of Mexico	186	1.9	0.3			U
West Indian manatee	Florida				Y	E	D
West Indian manatee	Antillean				Y	E	D

¹ N_{MIN} = Minimum population is estimated as the lower 20th percentile of the log-normal distribution of the population estimate, which is equivalent to the lower limit of a 60% two-tailed confidence interval.

² PBR = Potential biological removal.

³ Strategic status: Y = yes, N/A = information is not available and N/D = estimated value has not been determined at this time.

⁴ MMPA/ESA status: E = listed as endangered and T = listed as threatened under the Endangered Species Act.

⁵ D = listed as depleted under the Marine Mammal Protection Act.

⁵ Trend is increasing (I), stable (S), decreasing (D), and unknown (U).

Approximately one-third of all right whale mortality is caused by human activities. Further, the small population size and low annual reproductive rate suggest that human sources of mortality may have a greater effect relative to population growth rates than for other whales. The principal factors believed to be retarding growth and, perhaps recovery of the population, are ship strikes and net entanglement. Marks or scars from entanglement with fishing gear were reported from 57% of living right whales, and 7% had major wounds probably due to collisions with ship propellers. Of the 25 mortalities recorded, five (20%) could be attributed to ship collisions, and three (12%) were the result of entanglements. Young animals, ages 0-4 years,

are apparently the most impacted portion of the population. In this age group, 20-30% of mortality is due to ship strikes.

The size of this stock is considered to be low relative to its OSP and this species is listed as endangered under the ESA. A Recovery Plan has been published and is in effect, though not completely implemented. The total level of human-caused mortality and serious injury is unknown, but reported human-caused mortality and serious injury has exceeded two right whales per year since 1990. This rate exceeds PBR and is significant because of the critically low population size and the low population growth rate. This is a strategic stock. □